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ON *EUCHIRELLA* (COPEPODA, CALANOIDA)
COLLECTED CHIEFLY BY THE U. S. STEAMER *ALBATROSS*
FROM THE PACIFIC OCEAN

OTOHIKO TANAKA¹⁾ and MAKOTO OMORI²⁾

With 10 Text-figures

At least 18 species of *Euchirella* have been reported from the Pacific and Indian Oceans. They are *Euchirella amoena* GIESBRECHT, *E. bella* GIESBRECHT, *E. bitumida* WITH, *E. curticauda* GIESBRECHT, *E. formosa* VERVOORT, *E. galeata* GIESBRECHT, *E. grandicornis* WILSON, *E. indica* VERVOORT, *E. intermedia* WITH, *E. maxima* WOLFENDEN, *E. messinensis* (CLAUS), *E. orientalis* SEWELL, *E. pulchra* (LUBBOCK), *E. rostrata* (CLAUS), *E. propria* ESTERLY, *E. tanseii* OMORI, *E. truncata* ESTERLY, and *E. venusta* GEISBRECHT. However, as some species have been described inadequately, we felt it necessary to correct specific determination of the genus *Euchirella*.

In the course of studies on *Euchirella* in the Izu region, we asked Drs. T.E. BOWMAN of the Smithsonian Institution, G. D. GRICE of the Woods Hole Oceanographic Institution, and W. VERVOORT of the Rijksmuseum van Natuurlijke Historie, for the loan of specimens of *E. indica* and *E. messinensis*. They were so kind enough to send us the specimens collected from several parts of the Pacific and Atlantic Oceans. During the examination of the materials from the Smithsonian Institution (C.B. WILSON's collections), we found that the vials labelled as *E. messinensis* contained a number of other species of *Euchirella*. Accordingly, we requested again from Dr. BOWMAN the loan of other samples of *Euchirella* taken by the U.S. STEAMER *Albatross* in the Pacific Ocean. He sent us the materials including the specimens collected by the R/V *Carnegie*. These specimens had previously been identified by Dr. G. O. SARS or Dr. C. B. WILSON, and reported by the latter (1942, 1950). As a result of re-examination of a total of 487 specimens of the WILSON Collection contained in 40 vials, the following copepods were found: 14 species of *Euchirella*, 1 species of *Neocalanus*, 1 species of *Undinula*, 1 species of *Gaidius*, 2 species of *Gaetanus*, 2 species of *Chirundina*, 1 species of *Chirundinella*, 2 species of *Undeuchaeta*, 1 species of *Euchaeta*, 3 species of *Scottocalanus*, 1 species of *Lophothrix*, 1 species of *Scaphocalanus*, and 1 species of the new genus *Wilsonidius* (Appendix-table).

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The present paper deals with the taxonomy of *Euchirella* collected chiefly by the R/V *Albatross* in the Pacific Ocean. Besides the description of a new species, redescrptions and revisions are given for some other species. In writing the diagnosis, the specimens collected from the Izu region by the R/V *Tansei Maru* of the Ocean Research Institute, University of Tokyo, were often used and they were compared with the *Albatross* specimens. The sampling data for the *Tansei Maru* specimens is given by TANAKA and OMORI (1968). All of the specimens borrowed have been returned to the institutions indicated. The *Tansei Maru* specimens are deposited in the Ocean Research Institute. A paper regarding the remaining species of the WILSON Collection will be published in the near future.

We wish to express our appreciation to Drs. T. E. BOWMAN, G. D. GRICE, and W. VERVOORT who permitted us to examine their important specimens. Dr. BOWMAN kindly read the manuscript and gave us helpful criticism. Thanks are also due to Prof. R. MARUMO of the Ocean Research Institute for his encouragement given during the course of the study.

Euchirella acuta, new species

(Fig. 1, a-n)

Occurrence: U.S.N.M. No. 122748, 2 ad. ♀ (paratypes), U.S.N.M. No. 122747, 1 ad. ♂ (holotype); U.S.N.M. No. 120661, 3 ad. ♂ (paratypes).

Descriptive notes: Female, 4.70 and 4.78 mm (paratypes). The cephalothorax and abdomen are in the proportional lengths as 80 to 20. The cephalothorax is 2.2 times as long as wide. The head is fused with the 1st thoracic segment, as are the 4th and 5th thoracic segment. The frontal margin of the head is broadly rounded in lateral view. The lateral margin of the last thoracic segment is round. The rostrum is slender and directed downwards.

The abdomen is 4-jointed; the segments have the following proportional lengths:

segment	1-2	3	4	5	furca	
	56	12	9	6	17	=100

The genital segment is as long as wide; the lateral margins are almost symmetrical; the dorsal distal margin is produced posteriorly and slightly overlaps the following segment; the genital area is produced below. The 3rd and 4th segments are each fringed with fine teeth on the distal margin. The furcal rami are slightly wider than long; the distal margin of each ramus is furnished with 4 long setae, an appendicular seta, and a small lateral spine.

The 1st antenna is 23-jointed, and extends to the distal margin of the furca: it

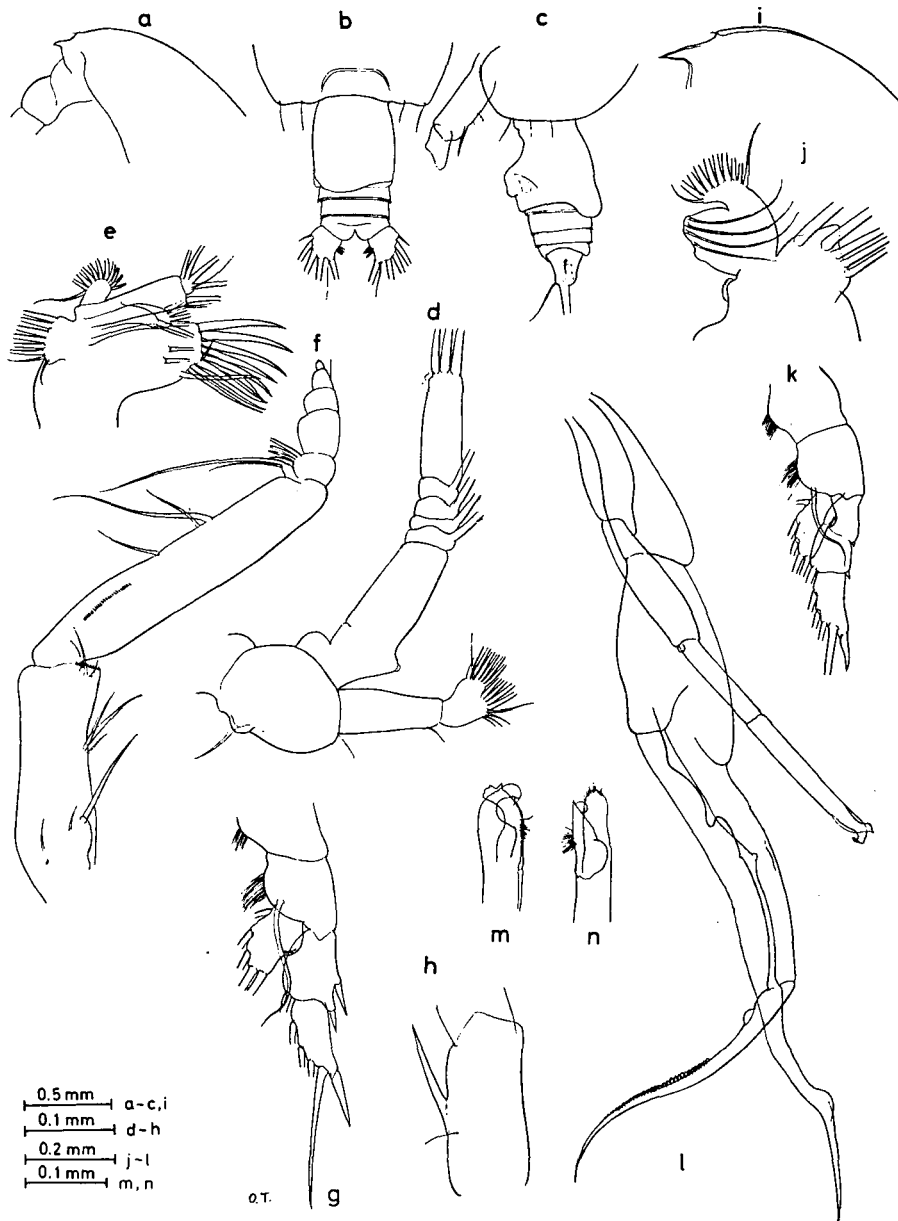


Fig. 1. *Euchirella acuta*, new species, female: *a*, head, lateral view; *b*, last thoracic segment and abdomen, dorsal view; *c*, last thoracic segment and abdomen, lateral view; *d*, 2nd antenna; *e*, 1st maxilla; *f*, maxilliped; *g*, 1st leg; *h*, 4th leg, 1st basal segment. male: *i*, head, lateral view; *j*, 1st maxilla; *k*, 1st leg; *l*, 5th pair of legs; *m*, left 5th leg, distal segment of exopod; *n*, another view of the same.

measures about 4.8 mm in length: the segments are in the following proportional length:

segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	62	53	25	21	23	23	23	39	27	29	25	53	50	65
16	17	18	19	20	21	22	23	24-25						
63	69	60	63	56	46	46	37	42	=1000					

The 2nd antenna has an exopod which is 2.2 times the length of the endopod. The 1st and 2nd segments of the exopod are fused, and there is a conical papilla on the inner proximal margin of the fused segments. The distal segment of the endopod carries 7 setae on the outer lobe, and 8 setae on the inner lobe. In the mandible the cutting blade is provided with 7 teeth and an inner marginal seta. The 1st maxilla has the following numbers of setae on the various lobes: 8 setae on the outer lobe; 11 setae on the exopod; 5 setae on the endopod; 3 setae on the 2nd basal segment; 2 setae on the 3rd inner lobe; 4 setae on the 2nd inner lobe; 13 setae on the 1st inner lobe. In the 2nd maxilla the 1st to 5th lobes are each furnished with 3 setae; the endopod with 7 setae. In the maxilliped the 2nd basal segment is 1.4 times the length of the 1st one. The 1st basal segment is furnished with a row of remarkable teeth on the outer distal margin: the 2nd basal segment has a row of spinules on the proximal outer margin.

The 1st leg has a 2-jointed exopod and a 1-jointed endopod. In the 1st segment of the exopod there are 2 spines on the outer margin. The 2nd leg has a 3-jointed exopod and a 1-jointed endopod; the terminal spine of the exopod has 20 teeth. In the 4th leg the 1st basal segment has a slender spine on the inner margin which exceeds the distal margin of the 1st basal segment.

Male, 3.85-3.89 mm (holotype, 3.89 mm). The cephalothorax and abdomen are in the proportional lengths as 80 to 20. The cephalothorax is 2.2 times as long as wide. The forehead resembles that of *E. venusta* but the rostrum is more robust.

The abdominal segments and furca are in the following proportional lengths:

segment	1	2	3	4	5	furca	
	29	26	16	13	3	13	=100

The 2nd and 3rd segments are fringed with fine teeth on the lateral distal margin: the 4th segment is fringed with leaf-like processes only on the dorsal distal margin; the furcal rami are as long as wide.

The 1st antennae extend to the end of the 1st abdominal segment. They are 20-jointed on the right and 21-jointed on the left, and measure 3.8 mm in length. The segments have the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
right	55	43	37	17	22	22	26	53	25	71	46	62
left	53	50	36	20	22	20	22	58	28	70	44	58
16	17	18	19	20	21	22	23	24-25				
64	70	63	65	100	60	51	48	=1000				
61	67	61	64	58	50	58	50	=1000				

In the 2nd antenna the exopod and endopod are in the proportional lengths of 6 to 4. The outer lobe of the endopod is provided with 6 setae; the inner lobe with 7 setae. The mandible has the usual structure with 8 setae on the distal margin of the 2nd segment of the endopod. In the 1st maxilla the exopod is furnished with 10 setae; the outer lobe has 2 large and 3 normal setae; the 1st inner lobe is represented by a process; the 2nd and 3rd inner lobes are absent; the endopod is furnished with 4 slender setae.

In the 1st leg the 1st and 2nd segments of the exopod are incompletely separated: the 1st and 2nd segments have each a minute spine on the outer margin. In the 5th pair of legs the 2nd basal segment of the left leg reaches the middle of the 2nd basal segment of the right leg. In the right leg the 1st and 2nd segments of the exopod are of equal lengths: the exopod is provided with 3 processes on the inner margin: the proximal one is large but low: the 2nd one is steep: the 3rd one is situated about the middle of the segment, and is very small. In males of the *E. messinensis* group there are usually 4 processes on the inner margin of the exopod. In the present specimen, however, the 4th process is entirely absent. In the left leg a minute endopod is present on the distal margin of the 2nd basal segment. The exopod extends about to the proximal prominence of the exopod of the right leg. The 3rd segment of the exopod forms a claw which is characteristic in shape: it resembles that of *E. venusta* figured by SEWELL (1947).

Remarks: The present female specimen resembles *E. truncata*. However, the genital segment is quite characteristic in shape. The male is similar to *E. venusta*, but is distinguished from it by the robust rostrum, the long basal segments of the left 5th leg, the shape of the terminal claw of the exopod of the same leg, and the structure of the exopod of the right 5th leg.

Euchirella amoena GIESBRECHT, 1888

Euchirella amoena GIESBRECHT, 1892, p. 233, pl. 15, fig. 20; ESTERLY, 1905, p. 155, fig. 21; MORI, 1937, p. 42, pl. 18, figs. 1-9; GRICE, 1962, p. 194, pl. 10, figs. 5-10; VERVOORT, 1963, p. 135.

Euchirella brevis SARS, 1925, p. 71, pl. 21, figs. 1-7.

Euchirella bella (partim).— WILSON, 1950, p. 218.

Occurrence: U.S.N.M. No. 122507, 5 ad. ♂; U.S.N.M. No. 122508, 1 ad. ♀;

U.S.N.M. No. 122509, 1 ad. ♂; U.S.N.M. No. 120655, 1 ad. ♂; U.S.N.M. No. 122510 1 ad. ♂.

Remarks: The species is easily recognized by the following characteristics: a triangular rostrum, a strong spine on the mandibular palp, 4 to 6 triangular spines on the inner margin of the 1st basal segment of the 4th leg, and 3 setae on the outer lobe and one seta on the inner lobe of the 2nd antenna in the female. The male has a strong spine on the 1st segment of the exopod of the right 5th leg; the 2nd antenna has 6+6 setae on the distal segment of the endopod.

The distribution and variation in length are listed in the following table:

Author	Locality	Depth	Length (mm)	
			♀	♂
ESTERLY, 1905	San Diego region	—	—	3.02
SARS, 1925	Atlantic	surface	3.9	—
MORI, 1937	Off Cape Shionomisaki	surface	3.5	3.3
GRICE, 1962	Equatorial Pacific	63–119 m	3.61–3.80	3.20–3.30
VERVOORT, 1963	Canary-Cape Verde Is.	0–4 m	3.20–3.50	3.30
TANAKA and OMORI (unpubl.)	Izu region	0–1250 m	4.00	—
<i>Present record</i>	Off Peru	surface	4.00	3.40–3.67

Euchirella bella GIESBRECHT, 1888

(Fig. 2, a-l)

Euchirella bella GIESBRECHT, 1892, p. 232, pl. 15, fig. 26; SEWELL, 1947, p. 71, fig. 13; VERVOORT, 1949, p. 17, figs. 8a, 9c, 9g; GRICE, 1962, p. 194, pl. 9, figs. 1–13.

Euchirella areata TANAKA, 1957, p. 186, fig. 50.

Euchirella venusta (♂).—TANAKA, 1957, p. 182, fig. 47, f, g.

Occurrence: U.S.N.M. No. 67073, 17 ad. ♀, 5 juv. ♀; U.S.N.M. No. 67074, 1 ad. ♀; U.S.N.M. No. 67075, 12 ad. ♀, 5 juv. ♀; U.S.N.M. No. 120653, 1 ad. ♂; U.S.N.M. No. 67084, 6 ad. ♀, 1 juv. ♀; U.S.N.M. No. 67085, 1 ad. ♂; U.S.N.M. No. 67122, 1 ad. ♂; U.S.N.M. No. 67123, 1 ad. ♀; U.S.N.M. No. 67124, 1 ad. ♀, 3 juv. ♀, 3 juv. ♂; U.S.N.M. No. 67125, 1 ad. ♀; U.S.N.M. No. 67134, 1 ad. ♀; U.S.N.M. No. 122511, 7 ad. ♀, 3 juv. ♀, 2 juv. ♂; U.S.N.M. No. 67136, 1 ad. ♂; U.S.N.M. No. 122512, 1 ad. ♂; U.S.N.M. No. 70318, 1 ad. ♂; U.S.N.M. No. 70390, 1 ad. ♂; U.S.N.M. No. 73897, 1 ad. ♀; U.S.N.M. No. 80216, 1 ad. ♀.

Remarks: *E. areata* is a synonym of *E. bella*, as pointed out by VERVOORT (1963). The identity of the male of *E. bella* described by WILSON (1950) is doubtful. His female specimen appears to be the female of *E. pulchra*. The present male and female specimens agree fairly well with those described by SEWELL (1947).

In the female the genital segment is asymmetrical; it is produced more on the right side when viewed dorsally: in lateral view the proximal half of the segment is concave, and is provided with a ridge on that area. The genital, 3rd, and 4th abdominal

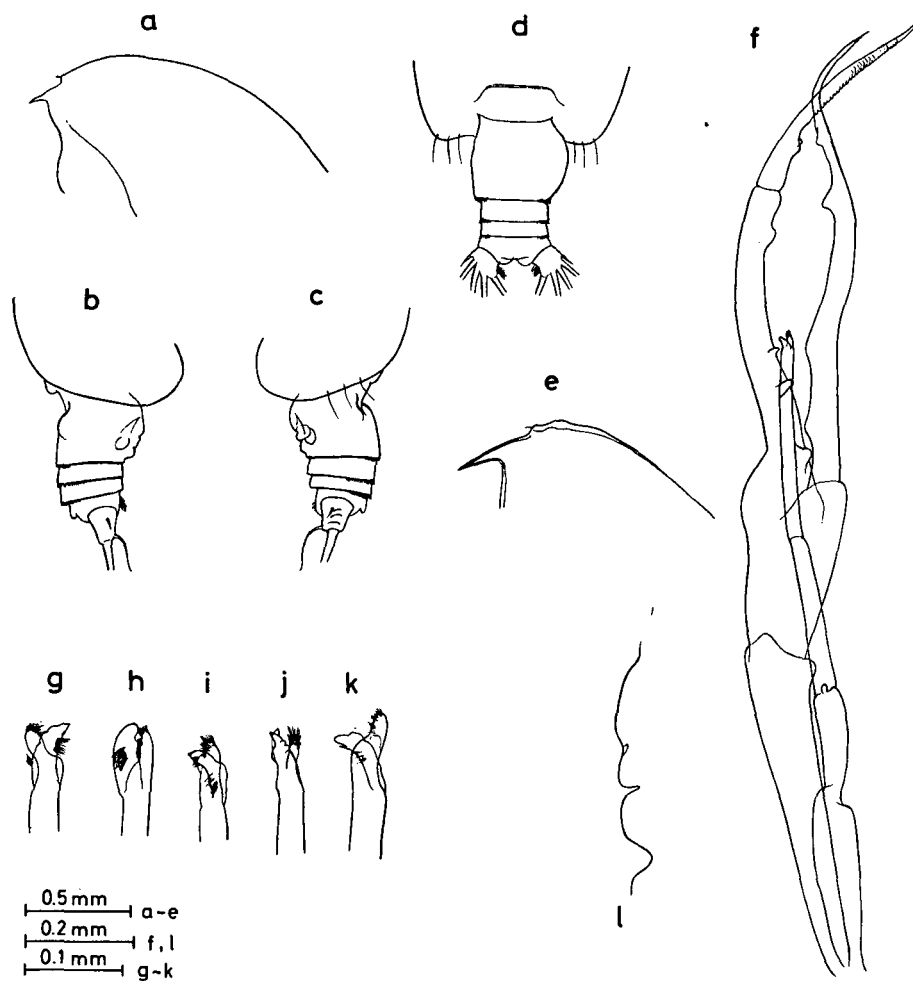


Fig. 2. *Euchirella bella* GIESBRECHT, female: a, head, lateral view; b, last thoracic segment and abdomen, lateral view from right side; c, last thoracic segment and abdomen, lateral view from left side; d, last thoracic segment and abdomen, dorsal view. male: e, head, lateral view; f, 5th pair of legs; g, left 5th leg, distal segment of exopod (*Tansei Maru* specimen, 3.50 mm); h, the same (*Albatross* specimen, 3.30 mm); i, the same (*Albatross* specimen, 3.40 mm); j, the same (*Albatross* specimen, 3.33 mm); k, the same (*Tansei Maru* specimen, 3.70 mm); l, right 5th leg, inner margin of exopod (*Albatross* specimen, 3.40 mm).

segments are fringed with fine teeth on the distal margin. In the 2nd antenna the distal segment of the endopod has 4 setae on the outer lobe and 5 setae on the inner lobe, although GRICE (1962) states that there are 5 setae on each lobe. The number of

spines on the 1st basal segment of the 4th leg is variable: some specimens have 5 spines on the right leg and 4 spines on the left one, others have 4 and 3 respectively.

In the male the 2nd antenna has the endopod furnished with 6 setae both on the outer and inner lobes. The 5th pair of legs is like that figured by SEWELL (1947). He shows the distal segment of the exopod of the left leg with a small spine on the outer margin, but the spine is absent in some of the present specimens. The claw on the distal segment of the exopod of the left leg varies in shape according to the orientation of the 5th pair of legs. *E. bella* closely resembles *E. venusta* in the shape of the forehead and the structure of the 5th pair of legs, but it is distinguished from the latter by the more produced frontal margin of the head. According to SEWELL (1947), the species is confined to the Indo-Pacific region.

Author	Locality	Depth	Length (mm)	
			♀	♂
SEWELL, 1947	Arabian Sea	0- 100 m	3.68-3.86	3.50
VERVOORT, 1949	Sawoe Sea	0- 60 m	-	3.15
TANAKA, 1957	Sagami Bay	0-1000 m	3.75	3.70
GRICE, 1962	Equatorial Pacific	0- 100 m	3.80-4.18	3.33-3.36
TANAKA and OMORI (unpubl.)	Izu region	0- 800 m	3.70-3.90	3.30
<i>Present record</i>	Off Peru	0- 300 fms.	3.80-4.85	3.26-3.36

Euchirella bitumida WITH, 1915

(Fig. 3, a-g)

Euchirella bitumida WITH, 1915, p. 131, text-fig. 34, pl. 5, fig. 9, pl. 8, fig. 4; VERVOORT, 1949, p. 35, fig. 17; WILSON, 1950, p. 219, pl. 23, figs. 332-335; TANAKA, 1957, p. 189, fig. 52; VERVOORT, 1963, p. 144; OWRE and FOYO, 1967, p. 46, figs. 254, 255, 257.
Euchirella galeata.—SEWELL, 1947, p. 74, fig. 14.

Occurrence: U.S.N.M. No. 70315, 1 juv. ♂; U.S.N.M. No. 122513, 1 ad. ♀.

Descriptive notes: Male. The specimens from the Izu region measure 4.90-5.10 mm in length; this is much smaller than those described by WILSON (1950) which measured 5.90-6.10 mm.

The cephalothorax and abdomen are in the proportional lengths as 80 to 20. The forehead has a high crest which terminates in a rather pointed apex when viewed laterally.

The abdominal segments and furca have the following proportional lengths:

segment	1	2	3	4	5	furca
	29	24	15	12	5	15 = 100

Segments 2-4 are each furnished with fine teeth on the distal margin.

The 1st antenna extends beyond the end of the furca: it measures about 5.0 mm in length: the segments of the left antenna have the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
	52	51	32	20	22	22	22	61	28	71	47	66
16	17	18	19	20	21	22	23	24-25				
62	68	62	63	55	43	49	41	63	=1000			

The 2nd antenna has a 7-jointed exopod which is 1.4 times the length of the endopod. The distal segment of the endopod is furnished with 6 long setae on the outer lobe, and 5 long and one short setae on the inner lobe. The mandible is strongly built; the endopod has 8 setae on the distal segment. In the 1st maxilla the outer lobe has 6 setae; the endopod has 10 setae; the 1st to 3rd inner lobes are much reduced. The 2nd maxilla is reduced. In the maxilliped the 1st basal segment is a little less than the length of the 2nd basal segment; these segments are slender.

In the 1st leg the exopod is 2-jointed; the 1st segment has 2 minute spines on the outer margin. In the 5th pair of legs the distal margin of the 2nd basal segment of the left leg reaches about the proximal one-third the length of the 2nd basal segment of the right leg. In the left leg the distal segment forms a claw which varies in shape according to the direction from which it is observed. In the right leg the 1st segment of the exopod is furnished with 4 prominences on the inner margin, of which the 3rd is very small.

Remarks: *E. bitumida*, both male and female, resembles *E. galeata* so closely that SEWELL (1947) stated that they are identical and *E. bitumida* is the Atalanitic form of *E. galeata*. He said that the slight differences in the character of the genital segment, on which the distinction is based, should only be regarded as significant at the level of varieties rather than species. However, the species differ in the first place in the shape of the forehead; in *E. bitumida* the head has a high triangular crest, whereas it is helmet-shaped and rounded at the apex in *E. galeata*. The genital segment is asymmetrical in both species. But, it is more produced on the right side than on the left in *E. bitumida*, while, it is more produced on the left side in *E. galeata*. In the 2nd antenna the endopod is distinctly longer in *E. bitumida* than in *E. galeata*.

The distribution and variation in length appear from the following table:

Author		Locality	Depth	Length (mm)	
				♀	♂
WITH,	1915	North Atlantic	250- 400 m	6.6 - 7.1	-
SEWELL,	1947	Arabian Sea	0- 400 m	6.10	-
VERVOORT,	1949	Flores Sea	0-2000 m	6.15	-
WILSON,	1950	Off Philippines	0- 290 fms.	6.1 - 6.7	5.9 - 6.1

TANAKA, 1957	Sagami Bay	0-1000 m	6.07	-
TANAKA and OMORI (unpubl.)	Izu region	0- 680 m	5.87-6.58	4.90-5.10
<i>Present record</i>	China Sea	0- 500 fms.	6.30	-

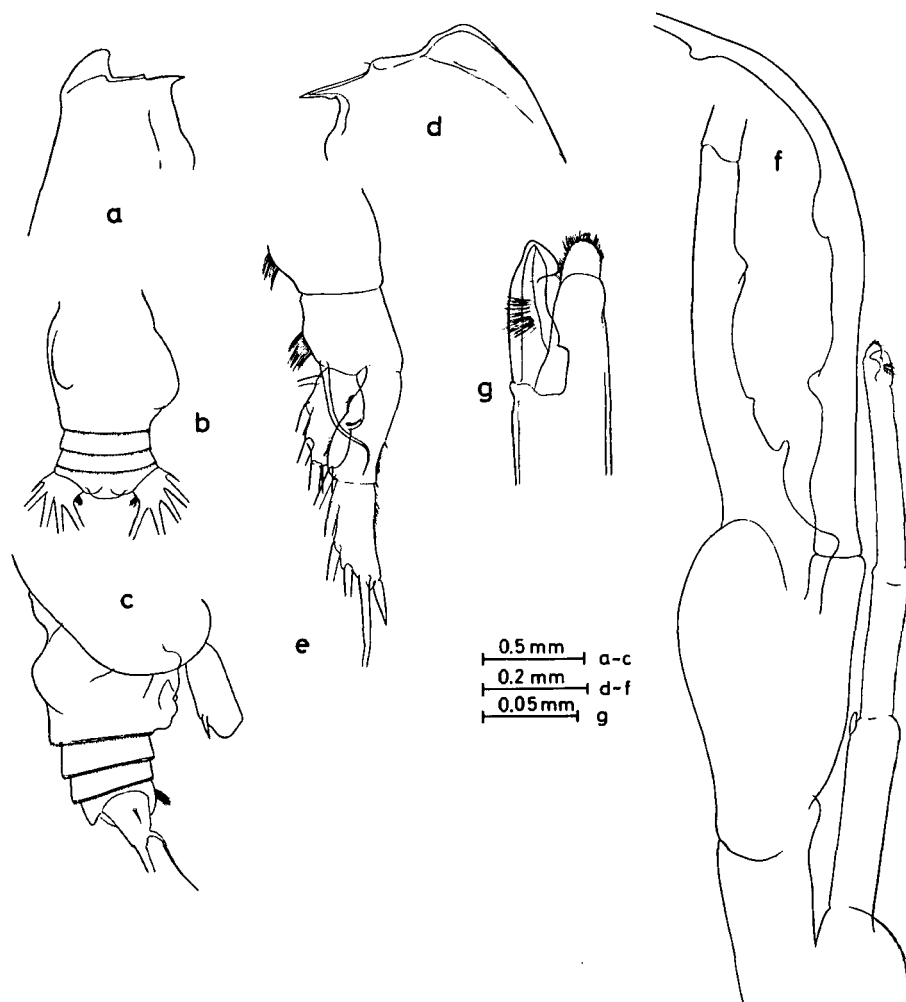


Fig. 3. *Euchiarella bitumida* WIRTH, female: a, head, lateral view; b, last thoracic segment and abdomen, dorsal view; c, last thoracic segment and abdomen, lateral view. male (*Tansei Maru* specimen): d, head, lateral view; e, 1st leg; f, 5th pair of legs; g, left 5th leg, distal segment of exopod.

Euchiarella curticauda GIESBRECHT, 1888

Euchiarella curticauda GIESBRECHT, 1892, p. 233, pl. 15, figs. 3, 13, 25, pl. 36, figs. 19, 20; ESTERLY, 1906, p. 59, pl. 9, fig. 6, pl. 10, fig. 27, pl. 12, fig. 62, pl. 13, fig. 67; Sars, 1925, p. 72, pl. 21, figs. 8-14; SEWELL, 1929, p. 109, fig. 41; DAVIS, 1949, p. 30, pl. 3, figs. 38-41; WILSON, 1950, p. 221, pl. 23, fig.

336; BRODSKY, 1950, p. 176, fig. 92; TANAKA, 1957, p. 187, fig. 51; GRICE, 1962, p. 196, pl. 10, figs. 11-14; VERVOORT, 1963, p. 148; OWRE and FOYO, 1967, p. 46, figs. 258-261.

Occurrence: U.S.N.M. No. 70313, 1 ad. ♀, 1 juv. ♀; U.S.N.M. No. 122514, 1 ad. ♀; U.S.N.M. No. 122515, 1 juv. ♂.

Remarks: The species is easily recognized by the forehead which is provided with a high crest and a short rostrum. The lateral margin of the last thoracic segment is rounded and has a small additional process on the distal margin. The number of spines on the inner margin of the 1st basal segment of the 4th leg varies from 8 to 11.

The distribution and size variation of the species are as follows:

Author	Locality	Depth	Length (mm)	
			♀	♂
GIESBRECHT, 1892	Pacific	0-1500 m	3.5	-
A. SCOTT, 1909	Malay Archipelago	0- 700 m	-	-
ESTERLY, 1906	San Diego region	0- 400 fms.	3.6	-
SARS, 1925	Atlantic	0-1500 m	4.40	-
DAVIS, 1949	Off Cape Flattery	0-1100 m	2.5 -4.8	3.0-4.3
BRODSKY, 1950	Far eastern seas of the USSR	0- 50 m	4.4	4.3
TANAKA, 1957	Izu region	0-1000 m	3.50	3.14
GRICE, 1962	Equatorial Pacific	0- 150 m	3.52-3.62	-
TANAKA and OMORI (unpubl.)	Izu region	0-1100 m	3.94	-
<i>Present record</i>	Off California and off Philippines	0- 100 fms.	3.30-3.77	-

Euchirella galeata GIESBRECHT, 1888

(Figure 4, a-k)

Euchirella galeata GIESBRECHT, 1892, p. 233, pl. 15, fig. 18, pl. 36, figs. 22, 26; ESTERLY, 1905, p. 155, fig. 22; SEWELL, 1929, p. 110, fig. 41; VERVOORT, 1949, p. 32, fig. 16; WILSON, 1950, p. 221, pl. 8, figs. 85-88, pl. 9, figs. 89-91, pl. 23, fig. 337.

Occurrence: U.S.N.M. No. 67078, 1 ad. ♀, 2 juv. ♀; U.S.N.M. No. 67128, 1 ad. ♀; U.S.N.M. No. 122518, 3 ad. ♀, 7 ad. ♂, 1 juv. ♀, 4 juv. ♂; U.S.N.M. No. 73900, 56 ad. ♀, 4 juv. ♀; U.S.N.M. No. 73901, 42 ad. ♀, 1 juv. ♀, 5 juv. ♂; U.S.N.M. No. 74392, 1 ad. ♀; U.S.N.M. No. 122519, 1 ad. ♂.

Descriptive notes: Male, 4.70-5.25 mm. The cephalothorax and abdomen are in the proportional lengths as 80 to 20. The forehead is helmet-shaped in lateral view and is rounded at the apex.

The abdominal segments and furca are in the following proportional lengths:

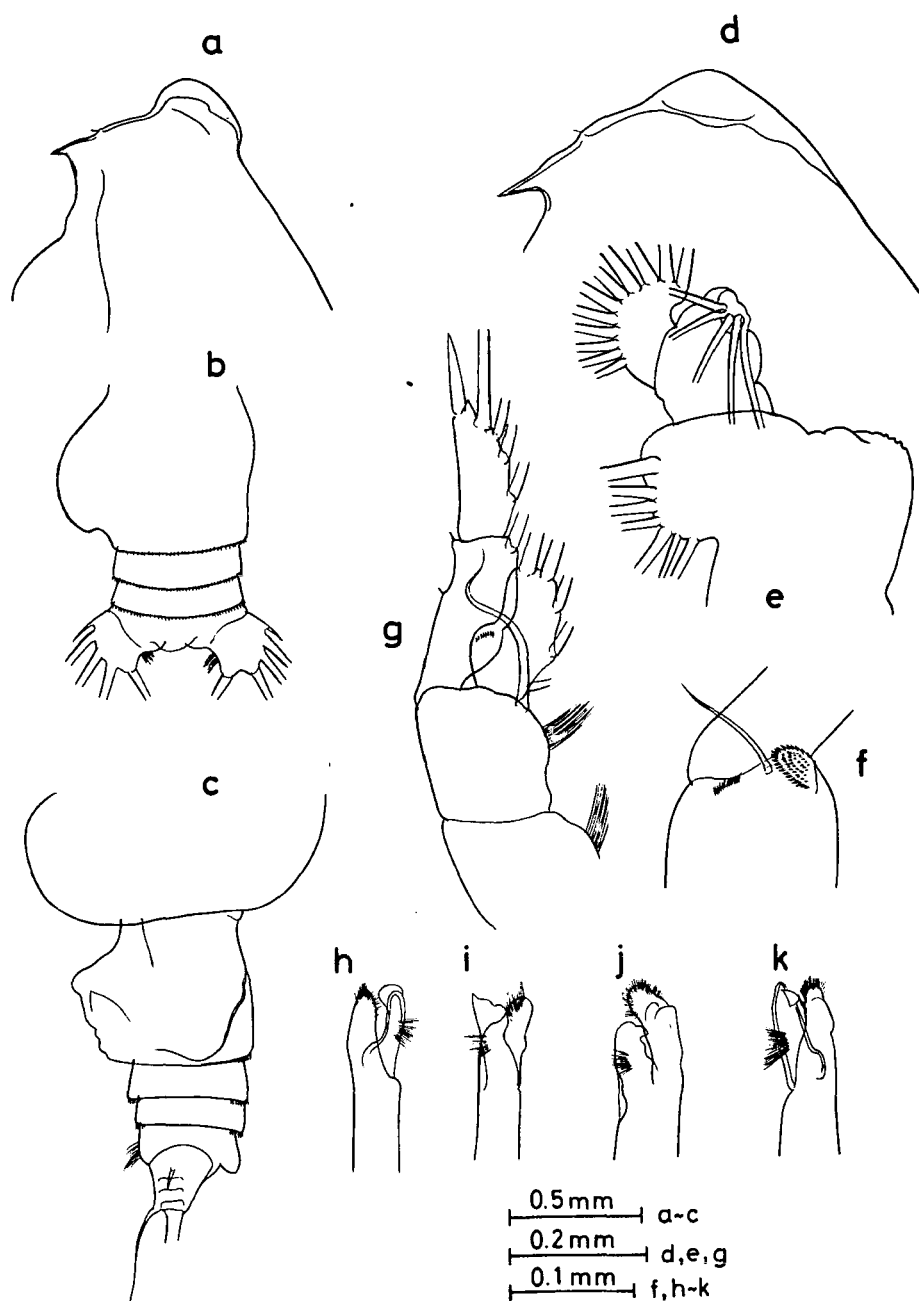


Fig. 4. *Euchiarella galeata* GIESBRECHT, female: a, head, lateral view; b, abdomen, dorsal view; c, last thoracic segment and abdomen, lateral view. male: d, head, lateral view; e, 1st maxilla; f, maxilliped, distal part of 1st basal segment; g, 1st leg; h, left 5th leg, distal segment of exopod (*Albatross* specimen, 4.70 mm); i, another view of the same; j, the same (*Albatross* specimen, 5.00 mm); k, the same (*Tansei Maru* specimen, 5.13 mm).

segment	1	2	3	4	5	furca	
	24	29	14	14	5	14	=100

The 2nd to 4th abdominal segments are fringed with fine teeth on the distal margin.

The 1st antenna has the segments in the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14
right	59	53	35	25	25	22	22	62	29	71	45
left	59	49	30	26	24	22	22	61	30	71	45
15	16	17	18	19	20	21	22	23	24-25		
66	64	70	59	66	96	47	39	45	=1000		
68	66	71	59	66	53	43	49	39	47	=1000	

The proportional lengths of the segment come near to those of *E. bitumida* except that of segment 24-25: in *E. bitumida* the last segment is 1.5 times the length of the 23rd, whereas, it is 1.2 times in *E. galeata*.

The mouth parts and 1st to 4th swimming legs are like those of *E. bitumida*. The 5th pair of legs is just like that of *E. bitumida*.

Remarks: The present species and *E. bitumida* are very closely related. However, they are easily separated by the shape of the forehead in both sexes, and by the shape of the genital segment in the female.

Author		Locality	Depth	Length (mm)	
				♀	♂
ESTERLY,	1905	San Diego region	—	6.5	—
SEWELL,	1929	Bay of Bengal	0-200 fms.	—	—
VERVOORT,	1949	Equatorial Pacific	0-60 m	5.20-5.90	—
WILSON,	1950	Off Peru	0-300 fms.	5.86	5.33
TANAKA and OMORI		Izu region	0-360 m	6.00	—
(unpubl.)					
<i>Present record</i>		Pacific	—	5.50-6.70	4.70-5.25

Euchirella grandicornis WILSON

(Figure 5, a-i)

Euchirella grandicornis WILSON, 1950, p. 223, pl. 9, figs. 98-100, pl. 10, figs. 101-105. [♀ only; ♂=*E. maxima* WOLFENDEN].

Occurrence: U.S.N.M. No. 123606, 16 ad. ♀, 7 juv. ♀, 2 juv. ♂; U.S.N.M. No. 67129, 45 ad. ♀, 12 juv. ♀, 2 juv. ♂; U.S.M.N. No. 67130, 6 ad. ♀, 4 juv. ♀; U.S.N.M. No. 67131, 1 ad. ♀; U.S.N.M. No. 70734, 1 juv. ♀, 10 juv. ♂.

Descriptive notes: Female, 5.97-6.80 mm. The specimen dissected (lectotype,

U.S.N.M. No. 67131) measured 6.18 mm in length.

The cephalothorax and abdomen are in the proportional lengths as 82 to 18. The cephalothorax is 2.5 times as long as wide. The frontal margin of the head

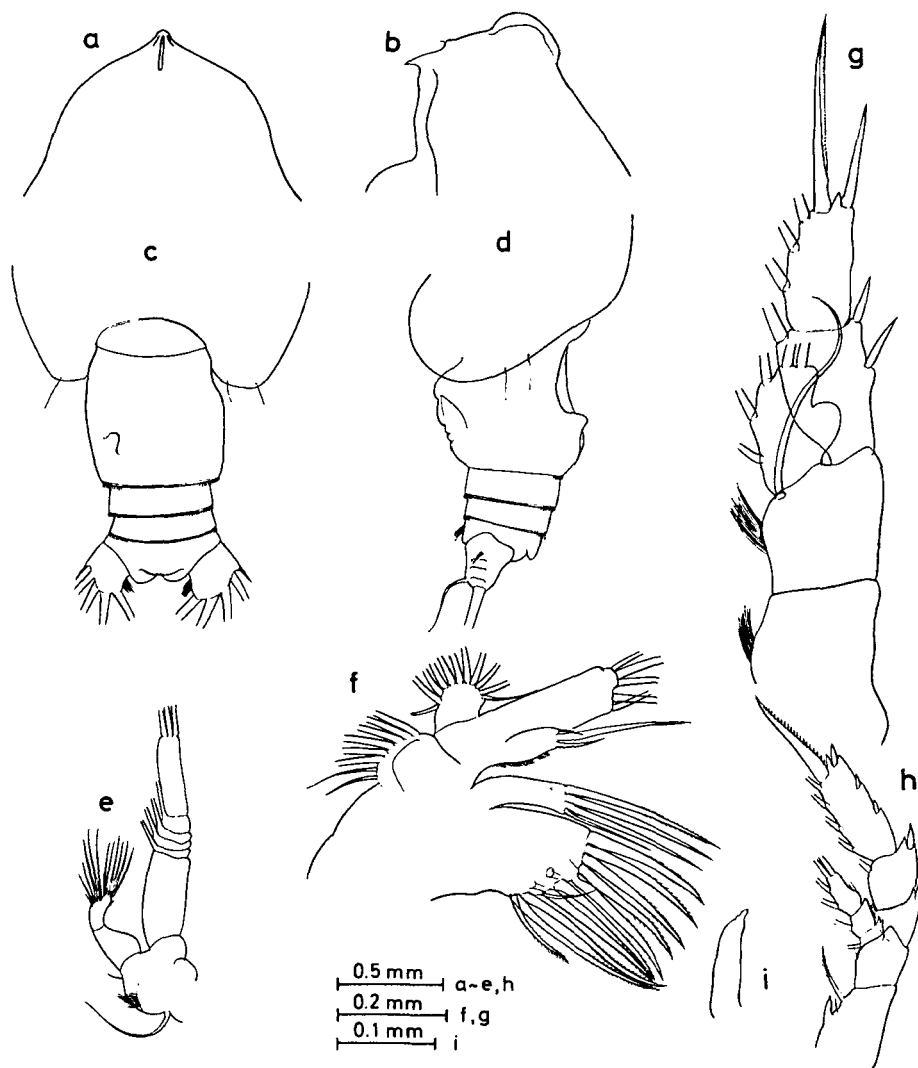


Fig. 5. *Euchiarella grandicornis* Wilson, female: a, head, dorsal view; b, head, lateral view; c, last thoracic segment and abdomen, dorsal view; d, last thoracic segment, lateral view; e, 2nd antenna; f, 1st maxilla; g, 1st leg; h, 4th leg; i, 4th leg, lateral spine of 1st basal segment.

has a low rounded crest when viewed from the side. The rostrum is small but sharply pointed. The lateral margin of the last thoracic segment is broadly rounded.

The abdomen is 4-jointed; the segments and the furca are in the following

proportional lengths:

segment	1-2	3	4	5	furca	
	56	14	10	6	14	=100

The genital segment is about as long as wide: it is asymmetrical, having a remarkable process on the dorsal surface near the left margin. The distal margins of the genital, 3rd, and 4th segments are fringed with fine teeth.

The 1st antenna is 23-jointed, and extends to the distal margin of the furca: the various segments are in the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
right	67	62	30	23	26	25	27	40	28	33	25	46	46	67
left	67	65	22	22	23	25	25	42	27	28	25	45	42	64
16	17	18	19	20	21	22	23	24	25					
59	68	58	62	52	42	42	31	31	10					=1000
62	70	62	67	55	44	42	33	33	10					=1000

The 2nd antenna has the exopod 2.6 times the length of the endopod. The distal segment of the endopod is furnished with 6 setae on the outer lobe, and 6 setae on the inner lobe. The mandibular palp is robust: the exopod has 6 setae: the endopod has 7 long and 2 short setae on the distal segment. The cutting edge is very simple. The 1st maxilla has the following numbers of setae on the various lobes: 8 setae on the outer lobe; 11 setae on the exopod; 3 setae on the endopod; 3 setae on the 2nd basal segment; 3 setae on the 3rd inner lobe; 4 setae on the 2nd inner lobe; 13 setae on the 1st inner lobe. In the 2nd maxilla the endopod carries 7 setae; the 1st to 5th lobes have each 3 setae. The maxilliped is, according to WILSON (1950), characteristic, but it is of the usual structure found in other members of the genus *Euchirella*.

In the 1st leg the exopod is composed of 2 segments. The 1st segment is furnished with 2 spines on the outer margin. The 2nd leg has a 3-jointed exopod and a 1-jointed endopod. The 3rd and 4th legs have each a 3-jointed exopod and endopod. In the 4th leg the 1st basal segment has only single spine on the inner margin, although WILSON (1950) described it as having 9 long spines. The spine is not pointed at the apex but narrowly rounded. The terminal spine of the exopod of the 4th leg is furnished with coarse teeth, about 20 in number.

Remarks: The species is closely allied to *E. galeata*, differing from it in the shape of the genital segment. The male described by Wilson (1950) under the name *E. grandicornis* is the male of *E. maxima*. According to him, the proximal half of the 1st antenna of the female is quite regularly and densely setose, and on the distal half the setae are irregularly scattered. However, it is of a normal structure like that found in other members of the genus.

Euchirella maxima WOLFENDEN, 1905

Euchirella maxima, A. SCOTT, 1909, p. 57, pl. 12, figs. 12-20; WOLFENDEN, 1911, p. 238, text-fig. 24, pl. 28, figs. 3-5; SARS, 1925, p. 75, pl. 22, figs. 1-7; SEWELL, 1929, p. 112, figs. 42, 43; SEWELL, 1947, p. 88, fig. 19; WILSON, 1950, p. 225, pl. 25, figs. 338, 339; GRICE, 1962, p. 196, pl. 10, fig. 15; VERVOORT, 1963, p. 147; OWRE and FOYO, 1967, p. 47, figs. 262-266.
Euchirella simplex ESTERLY, 1911, p. 320, pl. 26, fig. 10, pl. 29, figs. 50, 62.

Occurrence: U.S.M.N. No. 122460, 1 ad. ♂; U.S.N.M. No. 122523, 1 juv. ♂; U.S.N.M. No. 122524, 1 ad. ♀, 2 juv. ♂; U.S.N.M. No. 122525, 1 ad. ♀.

Remarks: The present specimens agree quite well with the description given by SEWELL (1947). The 5th pair of legs in the male resembles that of the genus *Gaetanus*. Some records of the distribution and size variation are summarized as follows:

Author	Locality	Depth	Length (mm)	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0-1000 m	7.20	-
WOLFENDEN, 1911	South Atlantic	0- 300 m	7.50-8.70	-
ESTERLY, 1911	San Diego region	0- 315 fms.	6.36	-
WITH, 1915	North Atlantic	0- 600 m	7.8-8.5	6.7
SEWELL, 1929	Bay of Bengal	0- 200 fms.	6.1-6.5	-
SEWELL, 1947	Arabian Sea	0-1500 m	7.25	7.02
WILSON, 1950	Off Philippines	0- 100 fms.	-	7.60
VERVOORT, 1963	Gulf of Guinea	100- 600 m	7.50	6.10-7.35
OWRE and FOYO, 1967	Florida Current	287- 684 m	7.0-7.5	-
TANAKA and OMORI (unpubl.)	Izu region	0- 360 m	7.00-7.50	-
<i>Present record</i>	Pacific	-	7.35-7.60	6.90

Euchirella messinensis indica, new rank

(Figure 6, f-m)

Euchirella messinensis.—A. SCOTT, 1909, p. 56; WILSON, 1950, p. 225; TANAKA, 1957, p. 180, fig. 46.
Euchirella indica VERVOORT, 1949, p. 23, figs. 8b, 9b, 11, 12a, b.

Occurrence: U.S.N.M. No. 67081, 4 ad. ♀; U.S.N.M. No. 67132, 2 ad. ♀; U.S.N.M. No. 122521, 2 ad. ♀; U.S.N.M. No. 70389, 1 ad. ♂; U.S.N.M. No. 73904, 3 ad. ♀, 2 ad. ♂; U.S.N.M. No. 122522, 2 ad. ♀; U.S.N.M. No. 120656, 1 ad. ♂.

Descriptive notes: Female, 4.40-4.90 mm. The cephalothorax and abdomen are in the proportional lengths as 82 to 18. The forehead is rounded, and there is no trace of a crest. The abdominal segments and furca are in the following proportional lengths:

segment	1-2	3	4	5	furca	
	54	13	9	7	17	=100

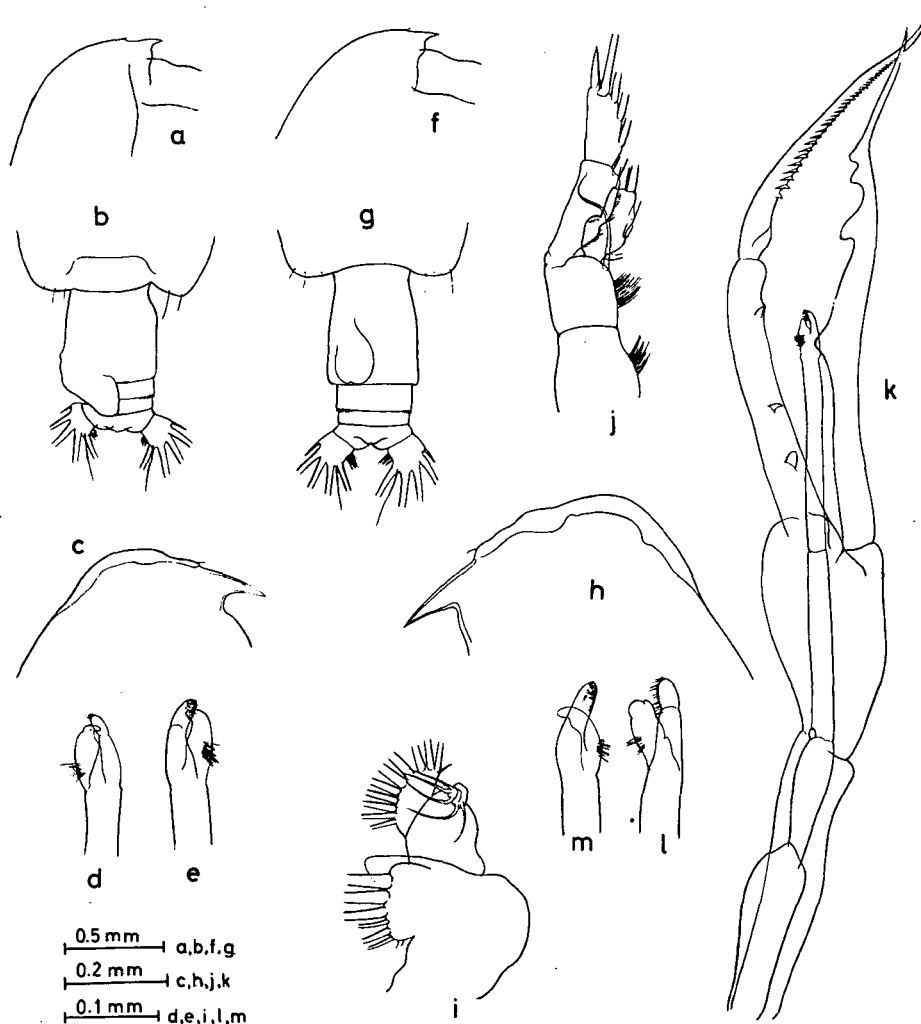


Fig. 6. *Euchirella messinensis* (CLAUS), female: a, head, lateral view (*Atlantide* specimen, 5.50 mm); b, last thoracic segment and abdomen, dorsal view (WHOI, No. 273 specimen, 4.40 mm). male: c, head, lateral view (WHOI, No. 66 specimen, 4.39 mm); d, left 5th leg, distal segment of exopod; e, another view of the same.

Euchirella messinensis indica, female: f, head, lateral view (*Tansei Maru* specimen, 4.90 mm); g, last thoracic segment and abdomen, dorsal view. male: h, head, lateral view (*Albatross* specimen, 4.60 mm); i, 1st maxilla; j, 1st leg; k, 5th pair of legs; l, left 5th leg, distal segment of exopod; m, the same (*Tansei Maru* specimen, 4.40 mm).

The genital segment is a little longer than wide. In dorsal view the segment is nearly symmetrical in outline and carries a sac-like protuberance near the left distal margin. The protuberance scarcely reaches the distal margin of the segment.

The development of the protuberance differs in various specimens. The 3rd segment is striated with fine teeth on the distal margin. The furcal rami are about as long as wide.

The 1st antenna extends to the distal margin of the 2nd abdominal segment. The segments are in the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9	10	11	12	13
	70	61	29	23	23	21	23	38	25	28	27	44
14	15	16	17	18	19	20	21	22	23	24-25		
44	51	64	68	61	70	55	46	44	38	47	=1000	

In the 2nd antenna the exopod is 3.2 times the length of the endopod. The distal segment of the endopod has 5 setae on the outer lobe and 4 setae on the inner lobe; these setae are plumose. The mandible has a long inner marginal seta on the cutting blade. The 1st maxilla has the following numbers of setae on the various lobes: 8 setae on the outer lobe; 11 setae on the exopod; 4 setae on the endopod; 3 setae on the 2nd basal segment; 2 setae and a small process on the 3rd inner lobe; 4 setae on the 2nd inner lobe; 13 setae on the 1st inner lobe. In the 2nd maxilla lobes 1-5 each have 3 setae; the endopod has 6 setae. The maxilliped has the following numbers of setae on the various lobes: 2+2+3 setae on the 1st basal segment; 3+2 setae on the 2nd basal segment; the 1st to 5th segments of the endopod have 4, 3, 3, 3+1, and 4 setae respectively.

The 1st leg has structure quite similar to that of *E. messinensis*. In the 4th leg the 1st basal segment has 2 unequal spines. In one of the specimens dissected the right leg has 3, and the left one has 2 spines.

Male, 3.91-4.80 mm. The cephalothorax and abdomen are in the proportional lengths as 76 to 24. The forehead has a low but distinct crest. The rostrum is depressed and directed downwards. The abdominal segments and furca are in the following proportional lengths:

segment	1	2	3	4	5	furca	
	25	23	17	18	2	15	=100

The left 1st antenna has the segments in the following proportional lengths:

segment	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	76	41	20	20	22	20	24	42	20	29	29	37	49	61
16	17	18	19	20	21	22	23	24-25						
64	71	61	71	56	46	46	41	54	=1000					

In the 2nd antenna the exopod is 1.4 times the length of the endopod. The

distal segment of the endopod has 7 setae on the inner lobe, of which 2 are slender; the outer lobe has 6 setae. The mandible is of the usual structure; the endopod is furnished with 8 setae on the distal segment. The 1st maxilla is reduced; the outer lobe has 6 long and 2 minute setae; the exopod has 10 long and one very short setae; the endopod has 5 setae; the 1st to 3rd inner lobes are completely reduced. The maxilliped is reduced; there is a single seta on the distal margin of the 1st basal segment.

The 1st leg has a 2-jointed exopod and a 1-jointed endopod: there are no marginal spines on the outer margin of the 1st segment of the exopod. The 5th pair of legs agrees well with that of *E. messinensis*. In the left leg the basal segments extend as far as the distal margin of the 1st basal segment of the right leg; the exopod extends a little beyond the proximal process on the endopod of the right leg: the 1st segment of the exopod is shorter than the 2nd segment: the 3rd segment is inserted on the lateral side of the 2nd one, forming the usual claw. In the right leg the exopod has, besides a blunt process near the base, 3 prominences, of which the proximal one is the largest; the 2nd segment of the exopod bears about 30 teeth along the inner margin.

Remarks: In the present study, the specimens, both female and male, obtained in the Pacific by the R/V *Albatross*, *Carnegie*, *Snellius* (Sta. 268) and *Tansei Maru* were all dissected and examined. They were carefully compared with the specimens of *E. messinensis* collected in the Atlantic (U.S.N.M. Nos. 69447 and 79512, WHOI Nos. 66 and 273, and *Atlantide* Sta. 139) (Fig. 6, a-e). All the Pacific specimens were identical with *E. indica* VERVOORT (1949), and except for the shape of the sac-like protuberance on the genital segment of the female there was no structural difference between *E. messinensis* and *E. indica*. We think these two are the same species, and *E. indica* is the Pacific subspecies of *E. messinensis*. As already noted by TANAKA (1957), *E. messinensis indica* is one of the most common species in the deep water of the Izu region. According to VERVOORT (1949), all the *Siboga* specimens reported from the Malay Archipelago region by A. SCOTT (1909) belongs to *E. indica*. Except for the record of ESTERLY (1905), there is no occurrence of the typical *E. messinensis* in the Pacific. In the Indian Ocean GRICE and HULSEMAN (1967) did not find *E. indica* but only *E. messinensis*. SEWELL (1929) and VERVOORT (1949) recorded the occurrence of the male of *E. messinensis* from the Indian seas. The distribution and the variation in length are shown in the following table:

Author	Locality	Depth	Length (mm)	
			♀	♂
A. SCOTT, 1909	Malay Archipelago	0- 750 m	-	-
VERVOORT, 1949	Malay Archipelago	0-1500 m	4.25-5.05	3.4
TANAKA, 1957	Izu region	0-1000 m	5.26	4.62
TANAKA and OMORI (unpubl.)	Izu region	0- 360 m	4.55-5.30	4.15-4.70
<i>Present record</i>	Pacific	-	4.40-4.90	3.91-4.80

Euchirella orientalis SEWELL, 1929

(Figure 7, a-i)

Euchirella orientalis SEWELL, 1929, p. 115, fig. 44; 1947, p. 76, fig. 15.*Euchirella formosa* VERVOORT, 1949, p. 29, figs. 14, 15; 1963, p. 134.*Euchirella trigrada* TANAKA, 1957, p. 184, fig. 49.

Occurrence: U.S.N.M. No. 122516, 1 ad. ♂; U.S.N.M. No. 120660, 16 ad. ♂; U.S.N.M. No. 122517, 1 ad. ♀; U.S.N.M. No. 120654, 1 ad. ♀.

Descriptive notes: Female, 5.25 mm. The specimens examined were collected in the Izu region: they measure 5.55–5.70 mm in length.

The cephalothorax and abdomen are in the proportional lengths as 80 to 20. The forehead is rounded, and there is no trace of a crest when viewed from the side.

The abdominal segments and furca have the following proportional lengths:

segment	1–2	3	4	5	furca	
	60	7	11	5	17	=100

The genital segment has tubercles on the left side, which vary in number from one to three. The lateral profile of the genital swelling agrees in shape fairly well with that figured by SEWELL (1947). The 3rd abdominal segment is fringed with fine teeth on the distal margin.

The 1st antenna reaches the distal margin of the genital segment. In the 2nd antenna the endopod is short, about one-fourth the length of the exopod. The distal segment of the endopod is furnished with 5 setae on the outer lobe, and 4 setae on the inner lobe. The 1st maxilla has the following numbers of setae on the various lobes: 8 setae on the outer lobe; 11 setae on the exopod; 4 setae on the endopod; 3 setae on the 2nd basal segments; 3 setae on the 3rd inner lobe; 4 setae on the 2nd inner lobe; 13 setae on the 1st inner lobe. The maxilliped agrees well with that described by SEWELL (1947).

In the 4th leg the 1st basal segment is provided with 2 unequal spines on the inner margin; the inner spine is longer than the outer one reaching the articulation of the 2 basal segments.

Male, 4.75–5.20 mm. The cephalothorax and abdomen are in the proportional lengths of 80 to 20. The forehead has a low crest which resembles closely that of *E. messinensis*, but in the present species there is a small glittering lens-like prominence on the anterior margin at about the middle.

The abdominal segments and furca are in the following proportional lengths:

segment	1	2	3	4	5	furca	
	27	26	14	17	6	10	=100

The 2nd and 3rd segments are striated with fine teeth on the distal margin.

The 1st antennae extend to the end of the 2nd abdominal segment; the segments have the following proportional lengths:

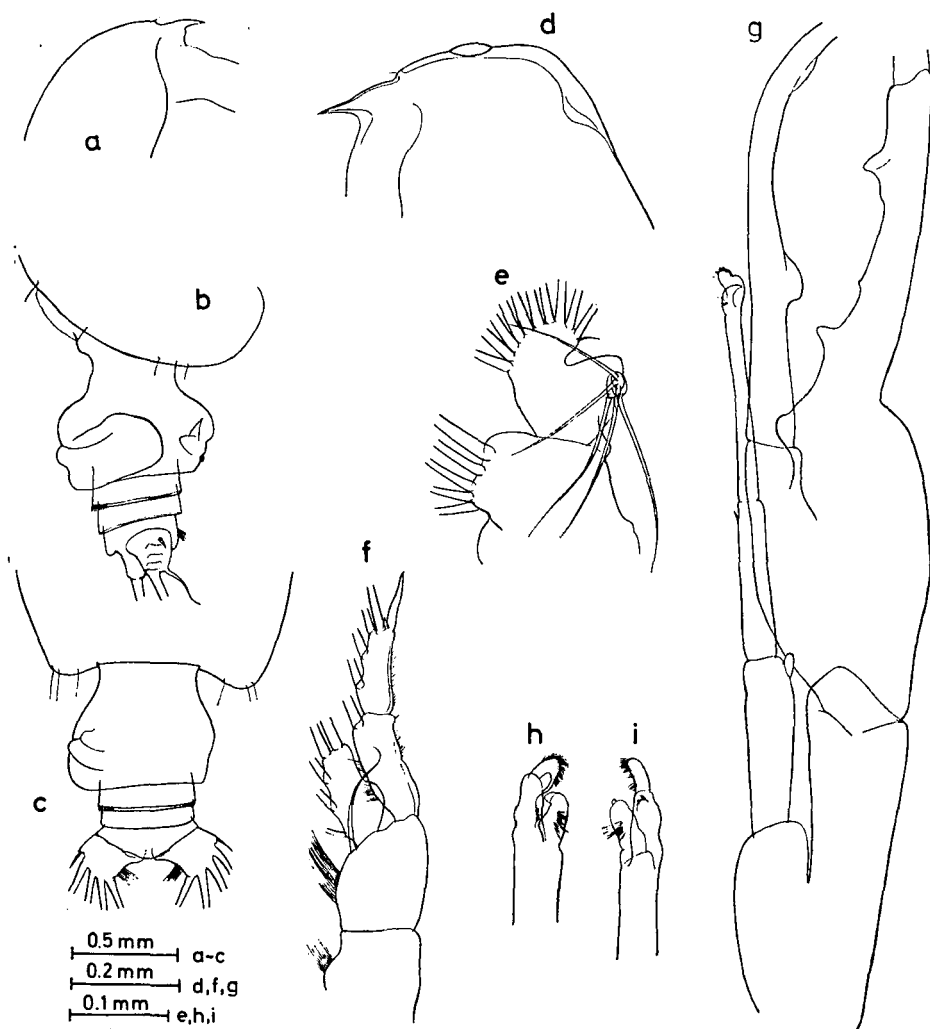


Fig. 7. *Euchirella orientalis* SEWELL, female: *a*, head, lateral view; *b*, last thoracic segment and abdomen, lateral view; *c*, last thoracic segment and abdomen, dorsal view. male: *d*, head, lateral view; *e*, 1st maxilla; *f*, 1st leg; *g*, 5th pair of legs; *h*, left 5th leg, distal segment of exopod; *i*, the same (*Tansei Maru* specimen, 5.20 mm).

segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
right	60	42	19	21	21	23	23	67	32	77	47	70
left	60	41	18	20	20	23	25	67	32	76	48	69
16	17	18	19	20	21	22	23	24-25				
65	72	63	65	98	49	42	44	=1000				
67	72	62	65	55	44	48	44	=1000				

In the 2nd antenna the exopod is 1.5 times the length of the endopod. The distal segment of the endopod has 6 long setae on the outer lobe, and 5 long and one small setae on the inner lobe. In the 1st maxilla the 1st to 3rd inner lobes are much reduced. The outer lobe has 6, the exopod has 10 setae; the endopod including the 2nd basal segment is furnished with 5 setae.

The 1st leg has a 2-jointed exopod and a 1-jointed endopod. There is a minute spine on the outer distal margin of the 1st segment of the exopod. The 5th pair of legs agrees well with that described by SEWELL (1947). In the left leg the 2nd basal segment reaches beyond the distal end of the 1st basal segment of the right leg; the 2nd segment of the exopod is a little more than the length of the 1st; the 3rd segment of the exopod forms a claw with the distal part of the 2nd segment; the shape of the claw is as figured by SEWELL (1947): the 1st segment of the exopod has a minute spine on the outer distal margin. In the right leg the 1st segment of the exopod is provided with 4 processes on the inner margin; the 1st process is large but blunt; the 2nd and 4th ones are steep; the 3rd is very small.

Remarks: On close examination of *E. orientalis*, *E. formosa*, and *E. trigrada* we were convinced that these three species are identical; among them *E. orientalis* has priority. Although SEWELL's figure (1929, 1947) of *E. orientalis*, especially the genital segment, is not complete, we judged that *E. orientalis* differs from *E. formosa* or *E. trigrada* only in the armature of the genital segment in the female. In SEWELL's specimen the distal margin of the genital segment of *E. orientalis* is furnished with spinules, whereas they are absent in *E. formosa* and *E. trigrada*. However, according to VERVOORT (1949), a similar variation in armature is found among the specimens of *E. venusta* taken from the Malay Archipelago. The tubercles on the female's genital segment appear to be variable in number, from zero to three in *E. orientalis*.

The distribution and size variation of the species are as follows:

Author	Locality	Depth	Length (mm)	
			♀	♂
SEWELL, 1929	Bay of Bengal	0-400 fms.	4.8	3.7
SEWELL, 1947	Arabian Sea	0-200 m	4.33-4.40	4.77
VERVOORT, 1949	Malay Archipelago	0- 60 m	5.10-5.20	-
TANAKA and OMORI (unpubl.)	Izu region	0-680 m	5.10-5.90	4.80-5.15
<i>Present record</i>	Western Pacific	-	5.25	4.75-5.20

Euchirella pulchra (LUBBOCK, 1856)

(Figure 8, a-f)

Euchirella pulchra, GIESBRECHT, 1892, p. 233, pl. 15, figs. 22, 23, pl. 36, figs. 13, 27; ESTERLY, 1905, p. 153, fig. 20; SARS, 1925, p. 69, pl. 20, figs. 5-7; SEWELL, 1947, p. 80, fig. 16; DAVIS, 1949, p. 31, pl. 3, figs. 42, 43, pl. 4, figs. 44-48; VERVOORT, 1949, p. 20, fig. 9, d, h; WILSON, 1950, p. 225; TANAKA, 1957, p. 178, fig. 45; GRICE, 1962, p. 194, pl. 10, figs. 1-4; VERVOORT, 1963, p. 145; OMORI, 1965, p. 64, figs. 19-21; OWRE and FOYO, 1967, p. 48, figs. 10, 269, 276.

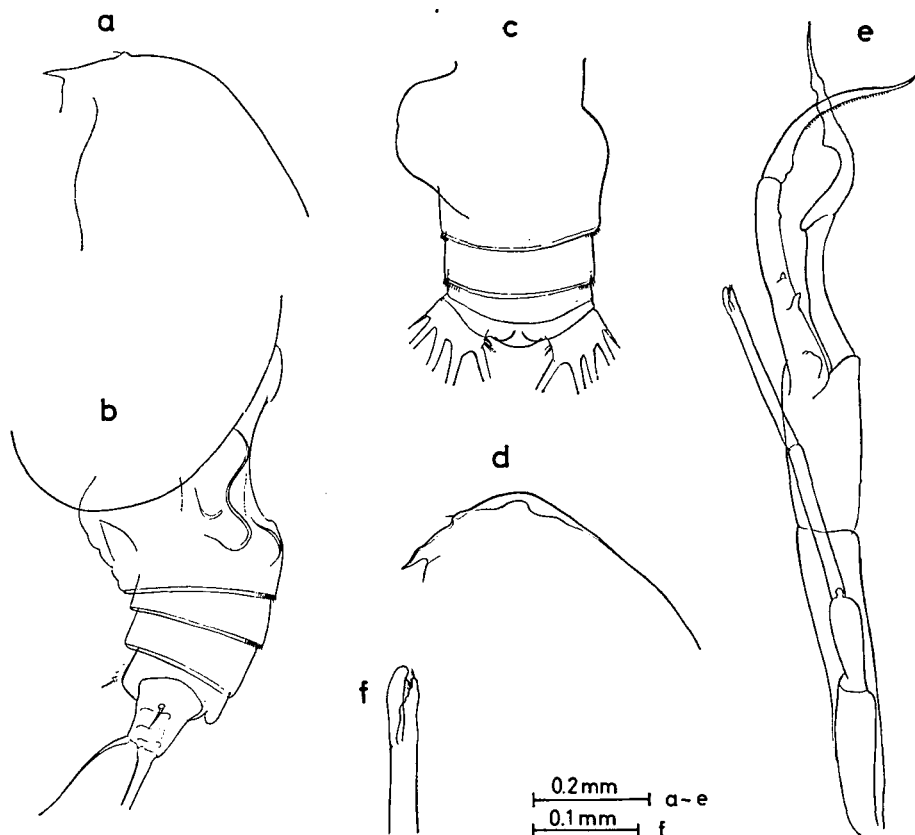


Fig. 8. *Euchirella pulchra* (LUBBOCK), female: *a*, head, lateral view; *b*, last thoracic segment and abdomen, lateral view; *c*, abdomen, dorsal view. male: *d*, head, lateral view; *e*, 5th pair of legs; *f*, left 5th leg, distal segment of exopod.

Occurrence: U.S.N.M. No. 67079, 2 ad. ♀; U.S.N.M. No. 67080, 2 ad. ♀, 2 juv. ♀; U.S.N.M. No. 73645, 1 ad. ♀; U.S.N.M. No. 120658, 4 ad. ♀, 3 ad. ♂; U.S.M.N. No. 73905, 8 ad. ♀.

Remarks: The female of *E. pulchra* is easily recognized by the round forehead and the round swelling on the left lateral margin of the genital segment. The

distal segment of the endopod of the 2nd antenna carries 6 setae on the outer lobe, and 6 setae on the inner lobe. In the male the basal segments of the left leg of the 5th pair of legs are short, only reaching the middle of the 1st basal segment of the right leg.

Author	Locality	Depth	Length (mm)	
			♀	♂
GIESBRECHT, 1892	Atlantic	—	4.4	—
SEWELL, 1947	Arabian Sea	0–200 m	3.37	4.15
DAVIS, 1949	Northeastern Pacific	0–100 m	3.4–4.4	3.0–3.8
VERVOORT, 1949	Malay Archipelago	160–250 m	2.90–3.55	—
TANAKA, 1957	Izu region	0–1000 m	3.47	3.06
GRICE, 1962	Equatorial Pacific	0–169 m	3.42	—
VERVOORT, 1963	Gulf of Guinea	0–10 m	3.13–3.70	—
TANAKA and OMORI (unpubl.)	Izu region	0–800 m	3.10–3.60	3.14
<i>Present record</i>	Western Pacific	—	2.88–3.50	3.09–3.15

Euchirella rostrata (CLAUS, 1866)

Euchirella rostrata, GIESBRECHT, 1892, p. 232, pl. 2, fig. 11, pl. 15, figs. 6, 27, 28, pl. 36, figs. 16, 17, 23; ESTERLY, 1905, p. 152, fig. 19; ESTERLY, 1911, p. 321, pl. 29, fig. 52, pl. 30, fig. 60, pl. 32, fig. 116; SARS, 1925, p. 69, pl. 20, figs. 8–15; DAVIS, 1949, p. 30, pl. 3, figs. 33–37; VERVOORT, 1957, p. 63; TANAKA, 1957, p. 177, fig. 44.

Occurrence: U.S.N.M. No. 122526, 1 ad. ♀; U.S.N.M. No. 122527, 1 juv. ♀; U.S.N.M. No. 80217, 7 ad. ♀.

Remarks: This common species has been reported from various parts of the Pacific, Atlantic, and Indian Oceans. The species can be distinguished easily from other members of the genus by the structure of the genital segment in the female and the 5th leg in the male. Some records of the distribution and size variation are shown in the following table:

Author	Locality	Depth	Length (mm)	
			♀	♂
GIESBRECHT, 1892	Mediterranean Sea	—	2.95–3.10	—
ESTERLY, 1905, 1911	San Diego region	0–60 fms.	2.97–3.10	3.00
FARRAN, 1929	Off New Zealand	surface	3.15–3.40	—
DAVIS, 1949	Northeastern Pacific	0–500 m	2.0–4.0	2.5–3.0
WILSON, 1950	Off Philippines	surface	—	—
TANAKA, 1957	Izu region	surface	3.58	3.01
TANAKA and Omori (unpubl.)	Izu region	0–520 m	3.35–3.95	—
<i>Present record</i>	Off Peru and East of Maryland	surface	2.85–3.90	—

(Figure 9, a-g)

Euchirella intermedia WITH, 1915, p. 124, text-fig. 32, pl. 4, fig. 4, pl. 8, fig. 3; VERVOORT, 1949, p. 28, fig. 13; WILSON, 1950, p. 225; TANAKA, 1957, p. 183, fig. 48.

segment	1	2	3	4	5	furca	
	27	22	18	18	4	11	=100

segment	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
right	57	36	18	16	22	22	24	65	30	77	47	67
left	57	42	17	19	21	23	23	63	29	77	48	67
16	17	18	19	20	21	22	23	24-25				
61	69	61	65	110	61	45	47	=1000				
65	69	63	67	63	50	50	43	43	=1000			

The 1st leg is of the usual structure: the 1st and 2nd segments of the exopod are fused, and these combined segments bear 2 small marginal spines. In the 5th pair of legs the 2nd basal segment of the left leg reaches the middle of the 2nd basal

segment of the right leg. In the left leg the 1st segment of the exopod is a little more than the length of the 2nd segment; there is a minute spine on the inner distal margin of the 1st segment of the exopod: the 3rd segment of the exopod makes the usual claw with the distal part of the 2nd segment; the shape of the claw agrees well with that

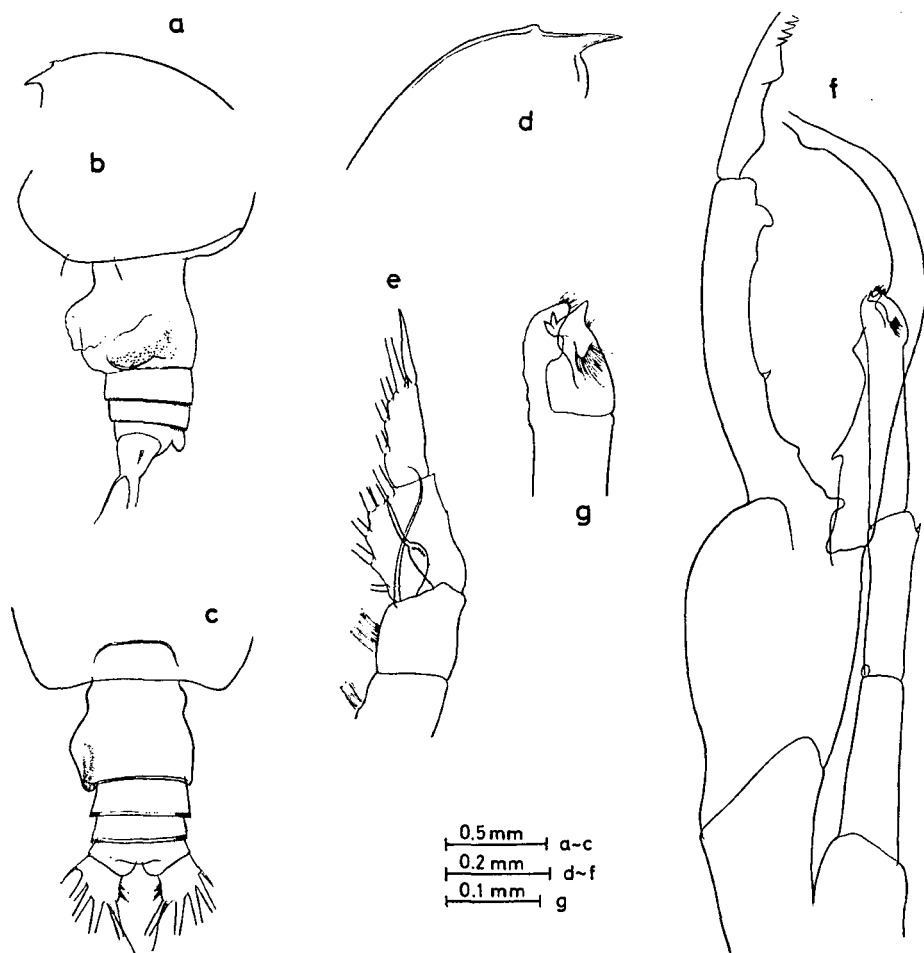


Fig. 9. *Euchirella truncata* ESTERLY, female: a, head, lateral view; b, last thoracic segment and abdomen, lateral view; c, last thoracic segment and abdomen, dorsal view. male: d, head, lateral view; e, 1st leg; f, 5th pair of legs; g, left 5th leg, distal segment of exopod.

figured by ESTERLY (1911). In the right leg the 1st segment of the exopod has 4 prominences on the inner margin of which the 1st and 4th are remarkable; the endopod is furnished with 3 prominences of which the proximal one is very acute.

Remarks: The female is easily recognized by the shape of the genital segment and the single strong spine on the 1st basal segment of the 4th leg. *E. propria* is,

as suggested by VERVOORT (1963), the male of *E. truncata*. The following table illustrates the distribution and size variation:

Author	Locality	Depth	Length (mm)	
			♀	♂
ESTERLY, 1911	San Diego region	0- 150 fms.	6.6	5.6
WOLFENDEN, 1911	South Atlantic	0-3000 m	5.6-6.0	-
WITH, 1915	North Atlantic	0- 300 m	5.66	5.3
SARS, 1925	North Atlantic	0-1000 m	6.20	-
SEWELL, 1947	Arabian Sea	0- 400 m	5.23-5.50	-
VERVOORT, 1949	Malay Archipelago	0- 60 m	5.55-6.05	-
TANAKA, 1957	Izu region	200- 400 m	6.19	-
TANAKA and OMORI (unpubl.)	Izu region	0- 920 m	5.80-6.40	5.10
Present record	Off Peru and Chile	0-300 fms.	5.25-5.35	4.92

Euchirella venusta GIESBRECHT, 1888

(Fig. 10, a-i)

Euchirella venusta GIESBRECHT, 1892, p. 233, pl. 15, fig. 19, pl. 36, fig. 21; SEWELL, 1947, p. 85, fig. 18; VERVOORT, 1949, p. 20, fig. 20; WILSON, 1950, p. 226, pl. 9, figs. 95-97; TANAKA, 1957, p. 182, fig. 47, a-c; GRICE, 1962, p. 194, pl. 9, figs. 14-25; OMORI, 1965, p. 64, figs. 22-24; OWRE and FOYO, 1967, p. 48, figs. 277-280.

Occurrence: U.S.N.M. No. 67135, 2 ad. ♀, 2 ad. ♂; U.S.N.M. No. 67137, 1 ad. ♀, 1 juv. ♀; U.S.N.M. No. 122530, 2 ad. ♀; U.S.N.M. No. 120659, 3 ad. ♀, 4 ad. ♂; U.S.N.M. No. 122531, 22 ad. ♀.

Descriptive notes: Female, 4.20-4.90 mm. The cephalothorax and abdomen are in the proportional lengths as 79 to 21. The head is fused with the 1st thoracic segment. The forehead is rounded, and there is no trace of a crest. The rostrum is slender and depressed; it is directed downwards.

The abdominal segments and furca are in the following proportional lengths:

segment	1-2	3	4	5	furca	
	59	14	9	4	14	=100

The genital segment agrees well with that described by SEWELL (1947) and VERVOORT (1949). In dorsal view the segment has a round swelling on the left lateral margin, and a tubercle on the right lateral margin. The swelling on the left margin in some specimens is not smooth but irregular in outline. According to SEWELL (1947), the genital and 3rd segments are each armed with a row of spinules on the distal margin. In the present material some specimens have no spinules on the genital segment.

The 1st antenna reaches a little beyond the end of the furca. In the 2nd antenna

the distal segment of the endopod carries 5 setae on the outer lobe, and 4 setae on the inner lobe. The mandible has the exopod and endopod of about the same length. In the 1st maxilla the outer lobe is furnished with 6 setae; the exopod with 11 setae; the endopod with 4 setae; the 2nd basal segment with 3 setae; the 3rd inner lobe with 2 setae and a small process; the 2nd inner lobe with 4 setae; the 1st inner lobe with 13 setae. The maxilliped has the basal segments of about equal length.

In the 4th leg the inner margin of the 1st basal segment is furnished with 2

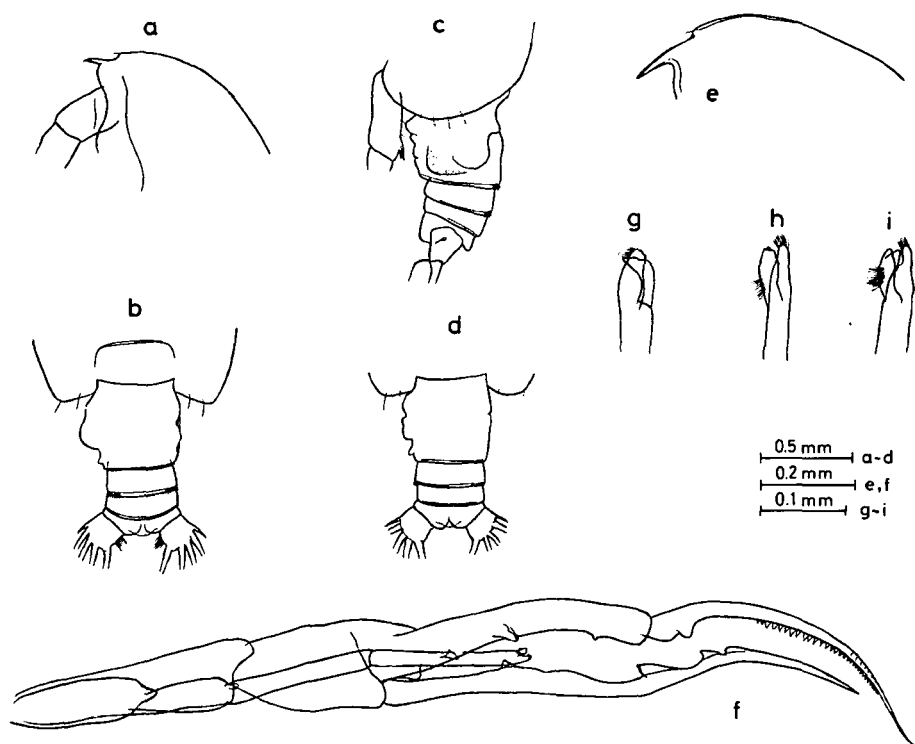


Fig. 10. *Euchirella venusta* GIESBRECHT, female: a, head, lateral view; b, last thoracic segment and abdomen, dorsal view; c, last thoracic segment and abdomen, lateral view; d, abdomen, dorsal view of another specimen. male: e, head, lateral view; f, 5th pair of legs; g, left 5th leg, distal segment of exopod; h, another view of the same; i, the same, another specimen.

spines of about equal length which reach the distal margin of the 1st basal segment.

Male, 3.57–4.16 mm. The cephalothorax and abdomen are in the proportional lengths as 77 to 23. The forehead is rounded and is devoid of any crest. The rostrum is slender and depressed, directing downwards.

The abdominal segments and furca are in the following proportional lengths:

segment	1	2	3	4	5	furca	
	29	29	16	14	2	10	=100

In the 1st antenna the various segments have the following proportional lengths which agree fairly well with those given by SEWELL (1947):

segment	1	2	3	4	5	6	7	8-9	10	11	12-13	14	15
left	66	44	21	18	21	21	24	36	24	27	69	47	63
16	17	18	19	20	21	22	23	24-25					
69	69	66	66	57	48	54	45	45	=1000				

In the 2nd antenna the distal segment of the endopod is furnished with 6 setae on the outer lobe and 7 setae on the inner lobe. In the 1st maxilla the 1st to 3rd inner lobes are much reduced; the outer lobe has 5 and the exopod has 11 setae.

The 1st leg has an usual structure: the 1st segment of the exopod is provided with 2 minute spines on the outer margin. In the 5th pair of legs the distal margin of the 2nd basal segment of the left leg reaches the distal margin of the 1st basal segment of the right leg. The exopod of the left leg is slender; the 2 segments are of equal length: the distal end of the 2nd segment of the exopod exceeds the proximal process on the outer margin of the endopod of right leg; the claw is as shown in the figures which agrees with that figured by SEWELL (1947). In the right leg the proportional lengths of the 2 basal segments are as 57 to 34; the 1st segment of the exopod is furnished with 4 processes on the inner margin, of which the 1st one is rounded, the 2nd one is sharply pointed, the 3rd is large and bluntly pointed, and the 4th is small. The endopod of the right leg has a triangular process on the outer margin at the level of the 3rd prominence on the inner margin of the 1st segment of the exopod.

Remarks: *E. tanseii* OMORI (1965) described from Sagami Bay is very closely related to *E. venusta*. However, in *E. tanseii* there is no tubercle on the right lateral margin of the genital segment and both outer and inner lobes of the distal segment of the endopod of the 2nd antenna are furnished with 6 setae each.

Some records of the distribution and variation in length of *E. venusta* are summarized as follows:

Author		Locality	Depth	Length (mm)	
				♀	♂
SEWELL,	1947	Arabian Sea	0- 500 m	4.38	3.80
VERVOORT,	1949	Malay Archipelago	0- 60 m	4.25-4.60	-
WILSON,	1950	Off Mexico	0- 300 fms.	-	-
TANAKA,	1957	Suruga Bay	0-1000 m	4.88	-
GRICE,	1962	Equatorial Pacific	0- 169 m	4.37-4.84	3.80
TANAKA and OMORI		Izu region	0- 360 m	4.40-4.85	-
(unpubl.)					
<i>Present record</i>		Western Pacific	-	4.20-4.90	3.57-4.16

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Appendix-table

Specimens of the Wilson Collection sent from the Smithsonian Institution and corrected identification of the species.

Original identification	Original U.S.N.M. cat. No.	Locality	Collector	Corrected identification	No. of Specimens	New U.S.N.M. cat. No.
<i>Euchirella bella</i>	67073	Between Easter and Galapagos Is.	Albatross Sta. 4700	<i>E. bella</i>	22 ♀	67073
	67074	Off Peru	Albatross Sta. 4665	<i>E. bella</i>	1 ♀	67074
	67075	?	Albatross	<i>E. bella</i>	17 ♀	67075
	67085	?	Albatross	<i>E. bella</i>	1 ♂	67085
	67122	Between Easter and Galapagos Is.	Albatross Sta. 4700	<i>E. bella</i>	1 ♂	67122
	67123	Off Chile	Albatross Sta. 15	<i>E. amoena</i>	5 ♂	122507
	67123			<i>E. bella</i>	1 ♀	67123
	67124	Panama and Easter to Galapagos Is.	Albatross Stas. 4638 and 4716	<i>E. bella</i>	4 ♀, 3 ♂	67124
	67125	Off Peru	Albatross Sta. 4667	<i>E. bella</i>	1 ♀	67125
<i>Euchirella bitumida</i>	70313	Off California	Albatross Sta. 4757	<i>E. curticauda</i>	2 ♀	70313
	70314	Off Peru	Albatross Sta. 4680	<i>Neocalanus robustior</i>	1 ♀	122533
	70314			<i>Chirundinella cara</i>	1 ♂	70314
	70315	Off British Columbia	Albatross Sta. 4758	<i>E. bitumida</i>	1 ♂	70315
	73897	Pacific	Albatross	<i>E. bella</i>	1 ♀	73897
				<i>E. galeata</i>	4 ♀, 11 ♂	122518
				<i>E. maxima</i>	1 ♀, 2 ♂	122524
				<i>Undeuchaeta magma</i>	1 ♀	122537
<i>Euchirella galeata</i>				<i>Scottocalanus infrequens</i>	1 ♀	122751
	67078	Off Central America	Albatross Sta. 4611	<i>E. galeata</i>	3 ♀	67078
	67128	Between Peru and Galapagos Is.	Albatross Sta. 4652	<i>E. galeata</i>	1 ♀	67128
				<i>E. grandicornis</i>	23 ♀, 2 ♂	123606
				<i>Chirundinella cara</i>	1 ♀	122503
	67129	Between Peru and Easter I.	Albatross Sta. 4697	<i>E. grandicornis</i>	57 ♀, 2 ♂	67129
	67130	Off Peru	Albatross Sta. 4664	<i>E. grandicornis</i>	8 ♀	67130
	70734	Off Peru	Albatross Sta. 4679	<i>E. grandicornis</i>	1 ♀, 10 ♂	70734
	73900	Pacific	Albatross	<i>E. galeata</i>	60 ♀	73900
				<i>E. venusta</i>	2 ♀	122530
				<i>Lophothrix frontalis</i>	1 ♂	122532
	73901	Pacific	Albatross	<i>E. galeata</i>	43 ♀, 5 ♂	73901
	74392	China Sea	Albatross Sta. 5320	<i>E. galeata</i>	1 ♀	74392
				<i>E. bitumida</i>	1 ♀	122513
				<i>E. maxima</i>	1 ♀	122525

Original identification	Original U.S.N.M. cat. No.	Locality	Collector	Corrected identification	No. of Specimens	New U.S.N.M. cat. No.
				<i>Gaetanus minispinus</i> , n. sp.	1 ♀	122750
				<i>Chirundina streetsi</i>	1 ♀	122505
<i>Euchirella grandicornis</i>	67131	Between Peru and Easter I.	Albatross Sta. 4681	<i>E. grandicornis</i>	1 ♀	67131
	67081		Albatross	<i>E. maxima</i>	1 ♂	122460
				<i>E. messinensis indica</i>	4 ♀	67081
				<i>E. bella</i>	1 ♂	120653
<i>Euchirella messinensis</i>	67132	Between Galapagos and Tuamotu Is.	Albatross Sta. 4732	<i>E. messinensis indica</i>	2 ♀	67132
	70318	Off Peru	Albatross Sta. 4679	<i>E. bella</i>	1 ♂	70318
				<i>Gaidius</i> sp.	1 ♀	—
				? <i>Gaetanus armiger</i>	1 ♂	122749
	70389	Off Equador	Albatross Sta. 4652	<i>E. messinensis indica</i>	1 ♂	70389
	70390	Off Equador	Albatross Sta. 4638	<i>E. bella</i>	1 ♂	70390
	73645	Off Philippines	Albatross Sta. 5785	<i>E. orientalis</i>	1 ♂	122516
				<i>E. pulchra</i>	1 ♀	73645
				<i>Scaphocalanus magnus</i>	1 ♀	122534
	73904	Pacific	Albatross	<i>E. acuta</i> , n. sp. (paratypes)	3 ♂	120661
				<i>E. messinensis indica</i>	3 ♀, 2 ♂	73904
				<i>E. orientalis</i>	16 ♂	120660
				<i>E. pulchra</i>	4 ♀, 3 ♂	120658
				<i>E. venusta</i>	3 ♀, 4 ♂	120659
	79512	Bahamas	Bache Sta. 10210	<i>E. messinensis</i>	14 ♀, 2 ♂	79512
				<i>E. curticauda</i>	1 ♂	122515
				<i>E. galeata</i>	1 ♂	122519
				<i>E. rostrata</i>	1 ♀	122527
				<i>Chirundina streetsi</i>	3 ♀, 1 ♂	122506
				<i>Undeuchaeta plumosa</i>	3 ♀	122538
				<i>Scottocalanus securifrons</i>	1 ♀, 1 ♂	122536
	80216	Off Chile	Carnegie Sta. 64	<i>E. amoena</i>	1 ♂	120655
				<i>E. bella</i>	1 ♀	80216
				<i>E. messinensis indica</i>	1 ♂	120656
				<i>E. orientalis</i>	1 ♀	120654
				<i>E. truncata</i>	1 ♂	120657
<i>Euchirella pulchra</i>	67079	Between Easter and Galapagos Is.	Albatross Sta. 4700	<i>E. pulchra</i>	2 ♀	67079
	67080	9°02'S, 123°20'W	Albatross Sta. 4740	<i>E. pulchra</i>	4 ♀	67080
	67133	Off SE. Alaska	Albatross Sta. 4750	<i>Wilsonidius alaskaensis</i> n. gen., n. sp.	1 ♀	67133
	67134	Between Peru and Easter I.	Albatross Sta. 4681	<i>E. amoena</i>	1 ♀	122508
				<i>E. bella</i>	1 ♀	67134
	73905	Off Philippines	Albatross Stas. 5120, 5190, and 5231	<i>E. pulchra</i>	8 ♀	73905
				<i>E. curticauda</i>	1 ♀	122514
				<i>E. messinensis indica</i>	2 ♀	122522

Original identification	Original U.S.N.M. cat. No.	Locality	Collector	Corrected identification	No. of Specimens	New U.S.N.M. cat. No.
				<i>E. orientalis</i>	1 ♀	122517
				<i>E. venusta</i>	22 ♀	122531
				<i>Chirundina indica</i>	1 ♂	122504
				<i>Scottocalanus rotundatus</i>	1 ♂	122535
	80127	Off Maryland	Carnegie Sta. 1	<i>E. amoena</i>	1 ♂	122510
				<i>E. rostrata</i>	7 ♀	80217
				<i>Undinula vulgaris</i>	1 ♀	122539
<i>Euchirella venusta</i>	67084	SW. of Central America	Albatross Sta. 4605	<i>E. bella</i>	7 ♀	67084
	67135	Between Peru and Easter I.	Albatross Sta. 4679	<i>E. venusta</i>	2 ♀, 2 ♂	67135
				<i>E. acuta</i> , n. sp. (holotype)	1 ♂	122747
				(paratypes)	2 ♀	122748
				<i>E. amoena</i>	1 ♂	122509
				<i>E. bella</i>	10 ♀, 2 ♂	122511
				<i>E. maxima</i>	1 ♂	122523
				<i>E. messinensis indica</i>	2 ♀	122521
				<i>E. rostrata</i>	1 ♀	122526
				<i>E. truncata</i>	2 ♀	122528
	67136	Off Chile	Albatross Sta. SF15	<i>E. bella</i>	1 ♂	67136
				<i>E. truncata</i>	2 ♀	122529
	67137	Off Peru	Albatross Sta. 4655	<i>E. venusta</i>	2 ♀	67137
				<i>E. bella</i>	1 ♂	122512